

Kanalku, Hasselborg, and Sitkoh, Subsistence Sockeye Salmon Stock Assessment

Abstract: Escapements of sockeye salmon into Kanalku, Kook, and Sitkoh Lakes were estimated through observer counts and mark-recapture studies, and the age, length, and sex composition of these populations were estimated using standard measurements and scale sampling and analysis. Sockeye salmon fry populations in each lake were estimated using hydroacoustic and trawl sampling. Light intensity, temperature, and dissolved oxygen were monitored in each lake, and zooplankton species distribution, abundance, and biomass were estimated, using standard limnological methods. Project objectives were met in all three lakes for adult estimates but not for fry, due to difficulties in estimating species apportionment. An escapement of about 1,600 sockeye salmon was estimated in Kanalku Lake, a dramatic increase from the very low escapement estimated in 2001. The increase is likely a direct result of the voluntary subsistence fishing moratorium initiated by the Angoon community in 2002. The estimated escapement of about 3,000 sockeye salmon in Kook Lake was also a dramatic increase over 2001, and may be attributed to removal of large woody debris from the outlet stream in 2001 and 2002. The escapement of around 12,000 sockeye salmon in Sitkoh Lake is similar to estimates over the past four to six years, and indicates this stock is probably healthy. Sockeye fry densities were as expected, very low in Kanalku Lake and in Kook Lake; fry density was substantially higher in Sitkoh Lake relative to the others, but still perhaps below the potential productivity of this lake. Sockeye fry populations appear not to be limited in these lakes by prey availability: total zooplankton biomass, as well as biomass and relative abundance of the preferred prey species *Daphnia longiremis*, was high in all three lakes, compared with other sockeye rearing lakes in Southeast Alaska. Interestingly, Sitkoh Lake, which had the highest sockeye fry density, also had the highest prey biomass, in terms of both total zooplankton and *Daphnia*. The sockeye salmon runs produced by Kanalku, Kook, and Sitkoh Lakes are important traditional subsistence resources for the people of Angoon, who desire to continue their traditions and be good stewards of these resources.

Juvenile and adult sockeye populations, and associated habitat variables, should continue to be monitored in these three systems, especially as sockeye populations are allowed to recover from low numbers in Kanalku and Kook Lakes. Continued monitoring will allow fisheries managers, biologists, and subsistence users to make sure they are allowing adequate escapements and maintaining potential productivity in these systems.

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